

# PATENT SPECIFICATION

807,725

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International Classification :—A61L.

## COMPLETE SPECIFICATION.

### Improvements in or relating to the Dispersion of Control Agents.

We, WAECO LIMITED, a British Company, of High Post, Salisbury, Wiltshire, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention comprises improvements in or relating to the dispersal of control agents. It is known that 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4,5,8-dimethanonaphthalene (hereinafter referred to as the specified control agent) is of use in the control of cockroach infestation, but hitherto difficulty has been experienced in dispersing the specified control agent in an efficient manner.

According to this invention, there is provided control agent dispersing means comprising a heater composition capable of combustion or exothermic reaction under confined conditions and having the specified control agent admixed therein, the heater composition being such that on burning or during such exothermic reaction a smoke is emitted containing the specified control agent as a constituent.

The heater composition is preferably charged into a container having an outlet at one end through which the smoke is emitted in operation, but, if desired, the composition with the specified control agent admixed therein may be compacted into the form of a pellet.

It is found that smoke generating means according to this invention are especially suitable for control of cockroach infestation in closed spaces.

According to a feature of this invention, the heater composition may comprise in addition

a mixture an organic combustible fuel, such as hexamine or thiourea, a substance such as potassium chlorate for supplying oxygen for combustion of the fuel, and an inert substance, such as china clay, for instance in the forms known as Stockalite and Devolite, or talc, the quantity of the organic combustible fuel and oxygen-supplying substance being insufficient to cause excessive decomposition of the specified control agent.

In general the combined weight of the fuel and oxygen-supply substance will not exceed about 30% of the weight of the mixture, including the specified control agent, and may be as low as 22%. The percentage weight of the inert substance may vary from about 9% to 25%.

It has been found that some compositions as above specified are mildly explosive due to the rate of build-up of pressure within a container during functioning.

According to a preferred feature of this invention the proportions or nature of the materials forming the mixture are selected to avoid this difficulty. For instance, the quantity of the inert substance may be selected to be near the upper end of the range above specified, or the weight of fuel and oxygen-supplying substance may be selected to be near the lower end of the range above specified, or the quantity of the specified control substance may be limited as compared with a composition which is explosive and the total weight of composition made up by addition of another volatilisable organic substance, which may also be a control agent, or by a combination of these steps.

The following examples of compositions according to this invention illustrate this feature. All proportions are by weight.

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		Example 1.	Example 2.	Example 3.	Example 4.
	Specified Control Agent ... ..	53.5%	53.5%	53.5%	9%
	Added substance—D.D.T. ... ..	—	—	—	44.5%
5	Fuel—Thiourea ... ..	9.5%	9.5%	9.5%	9.5%
	Potassium Chlorate ... ..	16.5%	16.5%	16.5%	16.5%
	Inert Substance				
	Talc ... ..	—	—	20.5%	20.5%
	Stockalite ... ..	20.5%	—	—	—
10	Devolite ... ..	—	20.5%	—	—
		Mildly explosive	Mildly explosive	Less explosive than Examples 1 & 2	Non-explosive
		Example 5.	Example 6.	Example 7.	Example 8.
15	Specified Control Agent ... ..	64%	10.5%	10.5%	32%
	Additional Volatilisable substance				
	D.D.T. ... ..	—	—	—	32%
	γ isomer of benzene hexachloride	—	53.5%	—	—
	hexachlorbenzene ... ..	—	—	53.5%	—
	Fuel—Hexamine ... ..	8%	8%	8%	8%
20	Potassium Chlorate ... ..	19%	19%	19%	19%
	Inert substance—Devolite ... ..	9%	9%	9%	9%
		Slightly explosive	Non-explosive	Non-explosive	Non-explosive
		Example 9.	Example 10.	Example 11.	Example 12.
25	Specified Control Agent ... ..	53%	26.5%	35.5%	40.5%
	Additional Volatilisable substance				
	γ isomer of benzene hexachloride	—	26.5%	17.5%	12.5%
	Fuel—Thiourea ... ..	9%	9%	9%	9%
	Potassium Chlorate ... ..	13%	13%	13%	13%
30	Inert substance—Devolite ... ..	25%	25%	25%	25%
		Non-explosive	Non-explosive	Non-explosive	Non-explosive

Of the foregoing examples, Example 9 is a preferred composition containing the specified control agent alone, which is non-explosive and functions smoothly, and Examples 8, 4, 10, 11 and 12 are preferred compositions containing volatilisable substances in addition to the specified control agent, which are non-explosive and function smoothly.

On discharge of smoke generators according to the above examples, it is found that a major proportion of each of the specified control agent and, where present, the additional volatilisable substance, is emitted in the smoke generated.

#### WHAT WE CLAIM IS:—

1. Control agent dispersing means comprising a heater composition capable of combustion or exothermic reaction under confined conditions and having the specified control agent as hereinbefore defined admixed therein, the heater composition being such that on burning or during such exothermic reaction a smoke is emitted containing the specified control agent as a constituent.

2. Control agent dispersing means according to Claim 1, wherein the heater composition is charged into a container having an outlet at one end through which the smoke is emitted in operation.

3. Control agent dispersing means according to Claim 1, wherein the composition with the specified control agent admixed therein is compacted into the form of a pellet.

4. Control agent dispersing means according to Claim 1 or Claim 2 or Claim 3, wherein the heater composition comprises in admixture an organic combustible fuel, such as hexamine or thiourea, a substance such as potassium chlorate for supplying oxygen for combustion of the fuel, and an inert substance, such as china clay or talc, the quantity of the organic combustible fuel and oxygen-supplying substance being insufficient to cause excessive decomposition of the specified control agent.

5. Control agent dispersing means according to Claim 4, wherein the combined weight of the fuel and oxygen-supplying substance forms between 22% and 30% by weight of the mixture including the specified control agent.

6. Control agent dispersing means according to Claim 4, or Claim 5, wherein the inert substance forms between 9% and 25% by weight of the mixture.

7. Control agent dispersing means according to any of Claims 4 to 6, wherein

the proportions of or nature of the materials forming the mixture are selected to avoid producing a mixture which is explosive.

8. Control agent dispersing means according to Claim 7, wherein the quantity of the inert substance is selected to be near the upper end of the range as specified in Claim 6, or the weight of fuel and oxygen-supplying substance is selected to be near the lower end of the range as specified in Claim 5, or the quantity of the specified control substance is limited as compared with a composition which is explosive and the total weight of composition made up by

addition of another volatilisable organic substance, which may also be a control agent, or by a combination of these steps.

9. Control agent dispersing means according to Claim 1, Claim 2 or Claim 3 wherein mixture has a composition substantially in accordance with any of the foregoing Examples 1 to 12.

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## PROVISIONAL SPECIFICATION.

### Improvements in or relating to the Dispersion of Control Agents.

- We, WAECO LIMITED, a British Company, of High Post, Salisbury, Wiltshire, do hereby declare this invention to be described in the following statement:—

This invention comprises improvements in or relating to the dispersal of control agents.

- It is known that 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4,5,8-dimethanonaphthalene (hereinafter referred to as the specified control agent) is of use in the control of cockroach infestation, but hitherto difficulty has been experienced in dispersing the specified control agent in an efficient manner.

- According to this invention, there is provided control agent dispersing means comprising a heater composition capable of combustion or exothermic reaction under confined conditions and having the specified control agent admixed therein, the heater composition being such that on burning or during such exothermic reaction a smoke is emitted containing the specified control agent as a constituent.

- The heater composition is preferably charged into a container having an outlet at one end through which the smoke is emitted in operation, but, if desired, the composition with the specified control agent admixed therein may be compacted into the form of a pellet.

- It is found that smoke generating means according to this invention are especially suitable for control of cockroach infestation in closed spaces.

- According to a feature of this invention, the heater composition may comprise in admixture an organic combustible fuel, such as

hexamine or thiourea, a substance such as potassium chlorate for supplying oxygen for combustion of the fuel, and an inert substance, such as china clay, for instance in the forms known as Stockalite and Devolite, or talc, the quantity of the organic combustible fuel and oxygen-supplying substance being insufficient to cause excessive decomposition of the specified control agent.

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It has been found that some compositions as above specified are mildly explosive due to the rate of build-up of pressure within a container during functioning.

According to a preferred feature of this invention, the proportions or nature of the materials forming the mixture are selected to avoid this difficulty. For instance, the quantity of the inert substance may be selected to be near the upper end of the range above specified, or the weight of fuel and oxygen-supplying substances may be selected to be near the lower end of the range above specified, or the quantity of the specified control substance may be limited as compared with a composition which is explosive and the total weight of composition made up by addition of another volatilisable organic substance, which may also be a control agent, or by a combination of these steps.

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5	Fuel—Thiourea ...	9.5%	9.5%	9.5%	9.5%
	Potassium Chlorate ...	16.5%	16.5%	16.5%	16.5%
	Inert Substance				
	Talc ...	—	—	20.5%	20.5%
	Stockalite ...	20.5%	—	—	—
10	Devolite ...	—	20.5%	—	—
		Mildly explosive	Mildly explosive	Less explosive than Examples 1 & 2	Non-explosive
		<i>Example 5.</i>	<i>Example 6.</i>	<i>Example 7.</i>	<i>Example 8.</i>
15	Specified Control Agent ...	64%	10.5%	10.5%	32%
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	$\gamma$ isomer of benzene hexachloride	—	53.5%	—	—
	hexachlorbenzene ...	—	—	53.5%	—
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		<i>Example 9.</i>	<i>Example 10.</i>	<i>Example 11.</i>	<i>Example 12.</i>
25	Specified Control Agent ...	53%	26.5%	35.5%	40.5%
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	Fuel—Thiourea ...	9%	9%	9%	9%
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On discharge of smoke generators according to the above examples, it is found that

a major proportion of each of the specified control agent and, where present, the additional volatilisable substance, is emitted in the smoke generated.

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